

ABSTRACT OF THE DISCLOSURE

A mixed extractant solvent including calix[4]arene-bis-(tert-octylbenzo)-crown-6 (“BOBCalixC6”), 4',4',(5')-di-(t-butylidicyclo-hexano)-18-crown-6 (“DtBu18C6”), and at least one modifier dissolved in a diluent. The mixed extractant solvent may be used to remove cesium and strontium from an acidic solution. The DtBu18C6 may be present from approximately 0.01M to approximately 0.4M, such as from approximately 0.086 M to approximately 0.108 M. The modifier may be 1-(2,2,3,3-tetrafluoropropoxy)-3-(4-sec-butylphenoxy)-2-propanol (“Cs-7SB”) and may be present from approximately 0.01M to approximately 0.8M. In one embodiment, the mixed extractant solvent includes approximately 0.15M DtBu18C6, approximately 0.007M BOBCalixC6, and approximately 0.75M Cs-7SB modifier dissolved in an isoparaffinic hydrocarbon diluent. The mixed extractant solvent may form an organic phase in an extraction system that also includes an aqueous phase. Methods of extracting cesium and strontium as well as strontium alone are also disclosed.